

PROGRESS REPORT (January 2021)

WP4: Implementation of innovations in food safety

BACKGROUND

Differences in licensing, regulations and food testing methods have huge potential to disrupt international trade. A EU-China research programme focussing on meat, dairy products and, fruits and vegetables will be undertaken to address these issues. The strengths of each method will be assessed and modified if necessary for future technology readiness and application.

OBJECTIVES

- To address current challenges and gaps in food safety testing through the implementation of new or improved analytical methods.
- To transfer analytical methodology and harmonise testing between China and the EU.
- To improve the safety and quality of food consumed in Chinese and European markets.
- To improve the food safety infrastructure in both China and the EU.

PROGRESS ACHIEVED SO FAR

- Multi-analyte UHPLC-HRMS method was developed by VSCHT and validated for screening of 425 analytes covering the classes of pesticides (n = 357), mycotoxins (n = 57) and plant toxins (11) in fruit, spices and teas. The method uses a rapid QuEChERS-like sample preparation, which allows the processing of large numbers of samples in a single day. The method was transferred to CAIQ and is undergoing evaluation. VSCHT are preparing samples for an inter-laboratory study.
- A new high throughput method, established for the determination chlorate and perchlorate residues in milk and milk powders using LC-MS/MS, has now been fully validated by Teagasc and has been accredited.
- A method for the analysis of nitrite and nitrate in milk powder was received from CFSA and is being set-up on a new ion chromatograph in the Teagasc laboratories. On advise from Thermofisiher and researchers at the US FDA the method is being adapted to UV and conductivity detection to broaden the applicability of the method to different dairy products.
- AZTI has developed a multianalyte enzyme inhibition screening method for pesticides residues showing high affinity towards 13 active substances. Work on the sample preparation protocol is ongoing.
- The methodology for the analysis of eight nitrofurans was evaluated with incurred tissue though and compared with a gold standard accredited methods. Microwave derivatisation conditions were further optimised using incurred tissue to give more accurate results for bound residues. Further work was also carried out on the LC conditions to improve column lifetime. A video has been made of this method and has been uploaded onto the virtual laboratory.
- FERA staff have written training content covering agreed topics on Food Contact Materials, which will be shared with CFSA staff.
- Sample preparation and LC-MS/MS detection methods was established at Teagasc for 13 antiviral drugs in meat. The test has recently transferred to a more sensitive LC-MS/MS to improve selectivity and sensitivity. A robust sample preparation procedure has been developed an amide column, which provides the most robust retention and separation of antiviral drugs. Work has commenced on the addition of antiviral drugs that could be potentially used against COVID-19 and African Swine flu. Although this will be most likely a separate method.
- Standardized operating protocols were developed for whole genome sequencing of three selected food-borne pathogens and transferred to Chinese collaborators. The methodologies are currently being trialled in Chinese laboratories.
- Chinese partner, CAU, have developed a new ELISA method for the analysis of ribavirin in chicken muscle tissue.



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SUCCESS STORY COMING SOON

- Multi-analyte UHPLC-HRMS method developed by VSCHT will be established in Chinese laboratories.
- The new LC-MS/MS method for nitrofurans method SOP and video has been uploaded onto the Virtual Laboratory.
- The validation of a method for influenza drugs in chicken muscle is in progress.



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